Ann. Natal Mus. Vol. 29(2) Pages 537–555 Pietermaritzburg October, 1988

Revision of *Orthactia* Kröber, 1912, with descriptions of six new species (Diptera: Therevidae: Phycinae)

by

Leif Lyneborg
(Zoological Museum, Copenhagen, Denmark)

ABSTRACT

The phycine genus *Orthactia* Kröber, 1912 is revised. The genus is redescribed and a possible sister-group relationship with the Palaearctic genus *Actorthia* Kröber, 1912 is discussed. A monophyletic group containing these two genera is proposed, and the autapomorphic characters of the group, such as the possession of a peculiar scutellar pilosity and long ventral setae on mid and hind tarsi, are associated with the burying habits of the adults of these stiletto-flies. *Orthactia* seems restricted in distribution to the Cape Province of South Africa and Namibia. Seven species are recognised, of which six are described as new, viz, *O. gobabebensis* (Namibia and north-western Cape Province), *O. irwini* (north-western Cape Province), *O. deserticola* (Namibia), *O. albopilosa* (northern Cape Province), *O. londti* (northern Cape Province), and *O. penicillata* (coastal northern Cape Province).

INTRODUCTION

The genus *Orthactia* Kröber, 1912 is a member of the tribe Phycini which together with the tribe Xestomyzini form the subfamily Phycinae. A list of the diagnostic characters for the Phycini and a revision of the Palaearctic genera are presented by Lyneborg (1983). Lyneborg (1987) reviewed the Phycini of southern Africa and announced that a revision of *Orthactia* was in preparation. The present paper includes a diagnosis of *Orthactia*, a key to the seven species, a redescription of the type species, *fascipennis* Kröber, 1912 and descriptions of six new species.

The members of the genus are all inhabitants of poor steppe and desert-like habitats, including coastal and riverine dune habitats, in the northern and north-western Cape Province of South Africa and in Namibia. Most of the material studied was collected in the seventies by Dr M. E. Irwin. Dr Irwin also made interesting observations on the habits of *Orthactia* adults. It seems that the flies bury themselves in the sand during the night and possibly also under unfavourable weather conditions. The digging is performed by means of the mid and hind tarsi which are provided with very long and strong setae. The peculiar and specifically distinct scutellar pilosity may also prove to be associated with digging. The scutellar pile may be shorter or longer, and with its erect position probably represents perfect sensory equipment for the fly when buried in the sand. The differing length and formation of the scutellar pile may possibly be associated with the grain-size of the sand in the various habitats.

TAXONOMY

Genus *Orthactia* Kröber

Orthactia Kröber, 1912:26. Type species: *Orthactia fascipennis* Kröber, 1912; des. by Lyneborg (1980:315).

Diagnosis: Medium-sized, broadly built phycines with patterned wings, modified scutellar pile, and elongate setae on mid and hind tarsi. Total length. 6,2–8,2 mm.

Head. Male eyes touching or nearly touching on frons. Upper facets frequently strongly enlarged, and area of enlarged facets may be elevated compared to lower part of eye. Female frons rather narrow to wide, with distinct pattern of tomentose and shiny areas. Lower frons more or less protruberant in both sexes, often rather abruptly set off from upper frons. Face concave and bare. Gena narrow to moderately wide. Anterior tentorial invagination close to lower eye-margin. Proboscis reaches to or beyond level of antennal bases; labella large and broad. Palpus short, obviously one-segmented, with strong pile on ventral surface. Antenna (Fig. 1) much shorter then depth of head, scape and first flagellomere being of nearly equal length, and scape narrower than first flagellomere. Flagellar style one-segmented, truncate apically, and here provided with a minute spine.

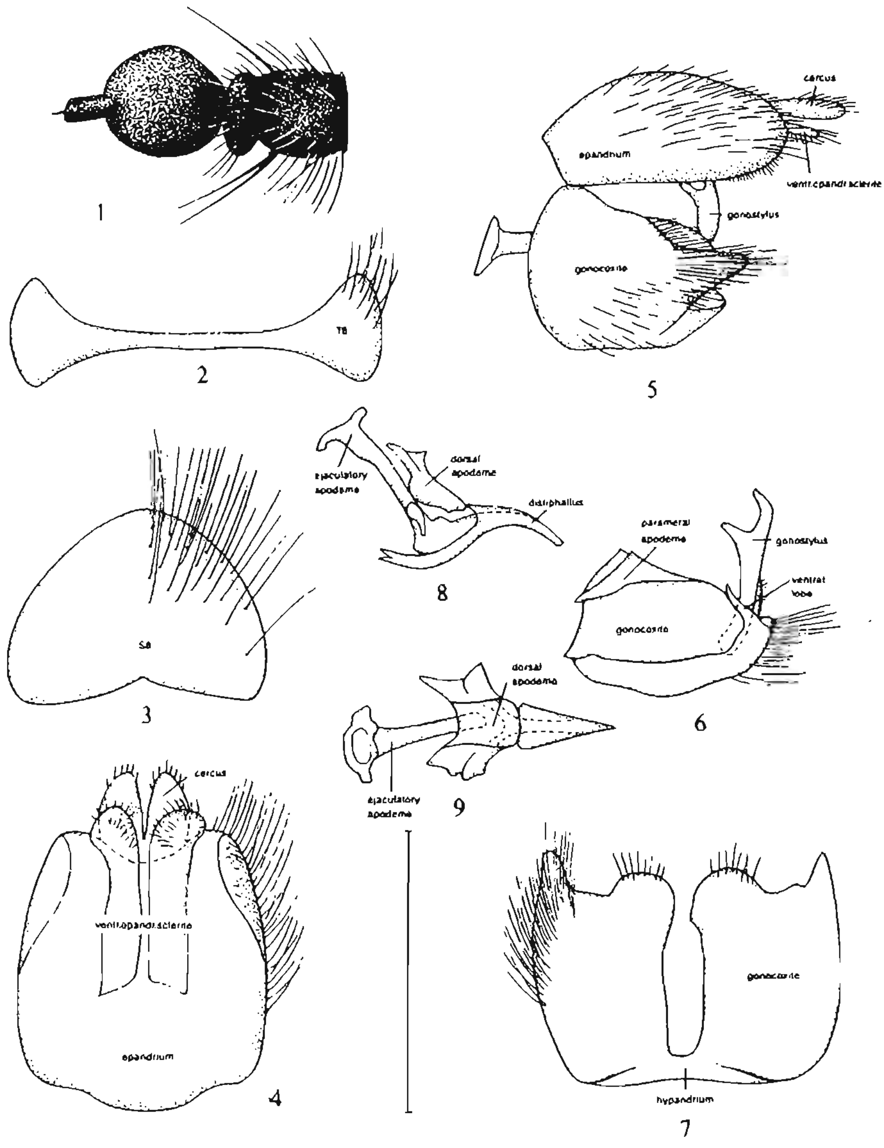
Thorax. Chaetation of mesonotum: np = 3–5, sa = 1, pa = 1, dc = 0, sc = (0)–1, ie. probably always present but in some species obscured by pile. Mesonotum with thick tomentum which may be patterned, contrasting strongly with the black and grey pleura. Prosternum with long pile on whole area in and around central depression. Scutellum with shorter or longer pile composed of stiff, erect hairs. The pile may be present along entire posterior margin, or mid-posterior part lacks pile. If pile is composed of long setae, it may obscure the pair of scutellar setae (Figs 15–19).

Wings. Costa terminates at anal vein (Cu_2 + 1A). Vein closing discal cell proximally has a transverse position. Cell r_4 about twice as long as wide. Cell m_3 closed and petiolate. All medial veins reach posterior wing-margin. Coloration of wing generally rather dark, patterned with streaks and rather indistinct bands. The pattern is caused by differently coloured microtrichia.

Legs. Mid coxa bare posteriorly. Hind femur with 2–13 anteroventral setae. Most species also have some anteroventral setae on fore femur, but mid femur usually without such setae. Fore tibia may be slender, or distinctly incrassate apically. Tibial setae usually very long and strong, especially in dorsal rows and in anteroventral row of hind tibia. Mid and hind tarsi with long and strong setae forming two ventral rows.

Abdomen. Broadly built, practically cylindrical in both sexes. Colour blackish, or more or less brownish or yellowish on the first segments, especially in ♀. Abdominal pilosity short and sparse.

Male terminalia (Figs 2–9). Epandrium (Figs 4–5) more or less squarish, its postero-lateral corners narrowly infolded. Cerci overhang paraproct. Paraproct fused with sternite 10. They form together a so-called 'ventral epandrial sclerite', which is developed as a pair of elongate sclerites reaching half-way towards anterior margin of epandrium, and are separated from each other by a weakly pigmented and weakly sclerotised strip along midline; no attachment to aedeagus. Gonocoxites (Fig. 7) seemingly fused ventrally for a short distance anteriorly, and hypandrium seems to form part of this area (as indicated in figure). Gonocoxite in

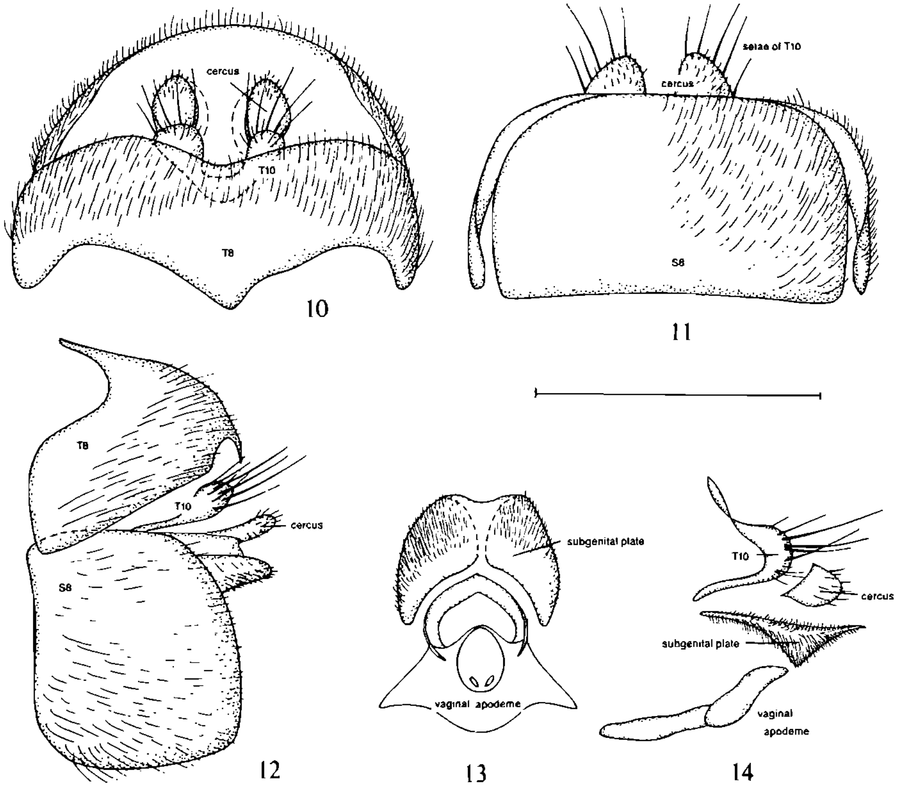

1
2
T8
3
S8
4
cercus
ventr.epandr.sclerite
epandrium
5
cercus
epandrium
ventr.epandr.sclerite
gonostylus
gonocoxite
6
parameral apodeme
gonostylus
ventral lobe
gonocoxite
7
gonocoxite
hypandrium
8
ejaculatory apodeme
dorsal apodeme
distiphallus
9
dorsal apodeme
ejaculatory apodeme

Figs 1–9. *Orthactia fascipennis* Kröber. 1. Antenna. 2–9. ♂ terminalia. 2. Tergite 8. 3. Sternite 8. 4. Epandrium with appendages (ventral aspect). 5. Genitalia (lateral aspect). 6. Right gonocoxite with appendages (mesal aspect). 7. Gonocoxites and hypandrium (ventral aspect). 8–9. Aspects of aedeagus. 8. Lateral. 9. Dorsal. Scale: 0,5 mm.

lateral view (Fig. 5) with a short posterior projection, the internal ventroposterior part forming a shelf posteriorly. Ventral lobe (Fig. 6) short and narrow. Gonostylus (Fig. 6) upright, in lateral view appearing forked apically. Distiphallus (Fig. 8) short compared to rest of aedeagus, forming a gently curved tube. Dorsal apodeme well developed, upright, forming broad and strongly sclerotised bridges to proximal part of parameres on dorsal edge of gonocoxite. Ventral apodeme a short, narrow trough which is forked apically. Ejaculatory apodeme (Figs 8–9) with distal part enlarged. T8 (Fig. 2) strongly constricted for a long distance. S8 (Fig. 3) triangular, with long pile on most of its surface.

Female terminalia (Figs 10–14). Segment 8 short and truncate; T8 and S8 rectangular. T9 and S9 absent. T10 present as a small continuous U-shaped sclerite, which is provided with some long thin setae. Cerci small. Subgenital plate (Fig. 13) weakly pigmented and without pile in midline, indicating a bilateral origin of the structure. Vaginal apodeme as in Figs 13–14.

Relationships. A sister-group relationship seems to exist between *Orthactia* and *Actorthia* Kröber, 1912, the latter being a largely Palaearctic genus not found in southern Africa (Lyneborg 1983). The two genera form a monophyletic group



Figs 10–14. *Orthactia fascipennis* Kröber, aspects of ♀ terminalia. 10. Dorsal. 11. Ventral. 12. Lateral. 13. subgenital plate and vaginal apodeme (ventral aspect). 14. Tergite 10, cercus, subgenital plate and vaginal apodeme (lateral aspect). Scale: 0,5 mm.

based on the following synapomorphies: scutellum with conspicuous aberrant pilosity, and mid and hind tarsi with long ventral setae. Both characters indicate similar habits of the two genera, as outlined in the introduction.

Orthactia is proposed as monophyletic on the basis of the following apomorphies: flagellar style one-segmented (two-segmented in *Actorthia*), paramere without free distal process (with free distal process in *Actorthia*), and hypandrium fused with gonocoxites (hypandrium free in *Actorthia*).

Distribution. *Orthactia* Kröber is found only in southern Africa. The centre of its distribution apparently lies in the north-western and northern parts of the Cape Province: Namaqualand and Bushmanland, six of the seven species occurring in that area. Two species occur further north in the deserts of Namibia; one of these is also found in the north-western Cape Province. Only the type-species, *fascipennis*, penetrates further south and east through the Karoo of the Cape Province and reaches the Orange Free State at Bethulie, and is apparently absent from the south Cape coastal region. Only one species, *penicillata*, has been recorded from coastal areas (at Hondeklipbaai in Namaqualand).

Key to species of *Orthactia*

1 Scutellar margin with extremely long and dense pilosity, hairs being as long as length of scutellum and obscuring pair of scutellar setae (Figs 17–19) 2

— Scutellum postero-laterally with short to moderately long pile of black or fulvous hairs, the hairs being at most two-thirds as long as the pair of scutellar setae; these consequently distinctly discernable (Figs 15–16) 4

2 Pilosity present along entire posterior margin of scutellum (Figs 18–19). Mesonotum in both sexes yellow-grey tomentose, with stripes of white-grey tomentum. Halter yellow 3

— Pilosity absent from mid-posterior margin of scutellum, thus forming a pair of dense brushes in position of scutellar setae (Fig. 17). Mesonotum uniformly yellow-grey tomentose. Halter black .... **penicillata** sp. n. ♂ ♀

3 White-grey stripes on disc of mesonotum broad, laterally more or less subshiny and here with mainly black hairs; such hairs also distributed down to area between sa and pa setae. Wing with extensive areas of black microtrichia in distal half. ♂: frontal triangle greyish tomentose; anterior facets strongly enlarged (Fig. 24). ♀: lower part of frons hardly protruding and with a narrow blackish band (Figs 26–27) .... **albopilosa** sp. n. ♂ ♀

— White-grey stripes on disc of mesonotum narrower, not subshiny laterally, and with a strictly pale pilosity as on rest of mesonotum. Wing with restricted areas of black microtrichia in distal half. ♂: frontal triangle shiny black; anterior facets very strongly enlarged (Fig. 25). ♀: lower part of frons strongly protruding and shiny black (Figs 28–29) .... **londti** sp. n. ♂ ♀

4 Pile on scutellum fulvous (as on mesonotum); hairs about half as long as pair of black scutellar setae. Halter white-yellow. ♂: eye-facets strongly enlarged, and area of enlarged facets elevated. ♀: frons with yellowish callus; tergites 1–5 bright yellow on dorsum .... **deserticola** sp. n. ♂ ♀

— Pile on scutellum black. Halter yellow, brownish or blackish. ♂: eye-facets at most moderately enlarged; area of enlarged facets usually not elevated. ♀: frons with black callus; tergites 1–5 may be brown, not bright yellow 5

5 Scape and first flagellomere shorter than wide. Only 3 notopleural setae. All mesonotal setae comparatively short .... **irwini** sp. n. ♂ ♀

— Scape and first flagellomere longer than wide. 4 (or 5) notopleural setae. All mesonotal setae of normal length. 6

6 ♂: eyes touching on frons .. **fascipennis** Kröber ♂ & **gobabebensis** sp. n. ♂

— ♀: eyes separated by a broad frontal strip 7

7 Frontal strip narrower and largely shiny black, only restricted tomentose areas at eye-margin (Fig. 20)...................... **fascipennis** sp. n. ♀

— Frontal strip wider and with large shiny black callus on lower half, upper half entirely tomentose (Fig. 22) .... **gobabebensis** sp. n. ♀

Orthactia fascipennis Kröber, 1912

Figs 1–15, 20–21.

Orthactia fascipennis Kröber, 1912: 27.

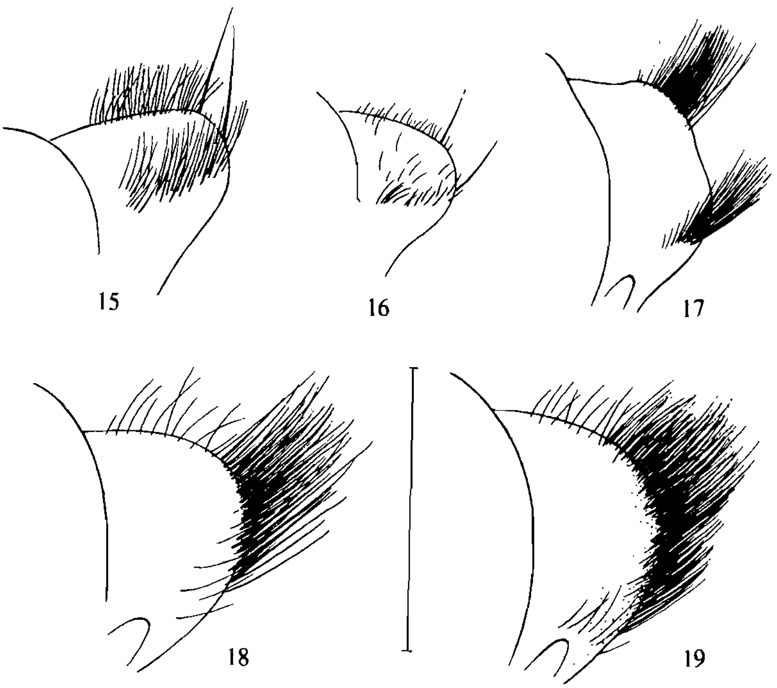
Redescription, ♂

Total length. 6,4–7,1 mm.

Head (Fig. 21). Eyes touching on frons for a distance equalling 1,0–1,5 times the height of ocellar triangle. Upper facets distinctly enlarged, but not elevated. Frontal triangle slightly elevated, forming a roundish callus, which may be shiny black, or more or less greyish tomentose above antennal bases; pile on frontal triangle composed of rather long dark hairs. Upper occiput yellow-grey tomentose, on each side with 10–12 short and slender postocular setae; lower occiput white-grey tomentose and with long whitish pile. Antennal proportions (Fig. 1): scape with a length: diameter ratio of 15:12, first flagellomere with a ratio of 20–21: 18, style 6. Antennae uniformly dull brown-black, scape with a few setae dorsally and ventrally, and with additional yellow-brown pile. Proboscis and palpi equally long and reaching to level of antennal bases. Pile on palpi yellow-brown.

Thorax. Mesonotal chaetation: np = 4(–5), sa = 1, pa = 1, dc = 0, sc = 1. Disc of mesonotum covered by a thick unpatterned tomentum, which has a grey-brown or grey-yellow tinge and becomes more pure grey laterally. The actual lateral margin, including notopleura, is shiny black. Mesonotal pile rather short and composed of yellow-brown and black hairs. Pleura predominately shiny black, with a greyish tomentose area covering posterior part of mesopleuron and most of sternopleuron; pleural pile whitish. Scutellum: pair of sc setae of normal length, surrounded by pile of stiff blackish hairs which are about half as long as the setae; mid-posterior margin of scutellum without pile (Fig. 15).

Wings. With two transverse grey-brown bands, separated by a whitish hyaline stripe from apex of Sc over base of discal cell to hind wing-margin; also apex and base of wing whitish hyaline. Veins dark brownish in the dark areas, yellowish in the hyaline areas. Knob of halter yellowish to brownish.



Figs 15–19. *Orthactia* ♂ scutellum (dorsolateral aspect). 15. *fascipennis* Kröber. 16. *irwini* sp. n. 17. *penicillata* sp. n. 18. *albopilosa* sp. n. 19. *londti* sp. n. Scale: 1 mm.

Legs. Fore femur with 3–7 anteroventral setae; mid femur with 0–1 anteroventral seta; hind femur with 6–10 anteroventral setae. Pilosity of fore femur mostly whitish, hairs about as long as femoral width. Longest seta on mid metatarsus about twice as long as metatarsal width. Legs entirely brown-black to black, femora at most slightly tomentose.

Abdomen. Tergites shiny black, T1 greyish tomentose laterally. T2 with a very distinct whitish distal border, and T3 with a narrower and darker border. Lateral portions of T1 and T2 with long whitish pile, and dorsum of these tergites and the following tergites with brownish to blackish pilosity. Sternites blackish, S2 with a broad whitish border. Pile whitish on S1–S3, blackish on the rest. Terminalia small, often partly concealed.

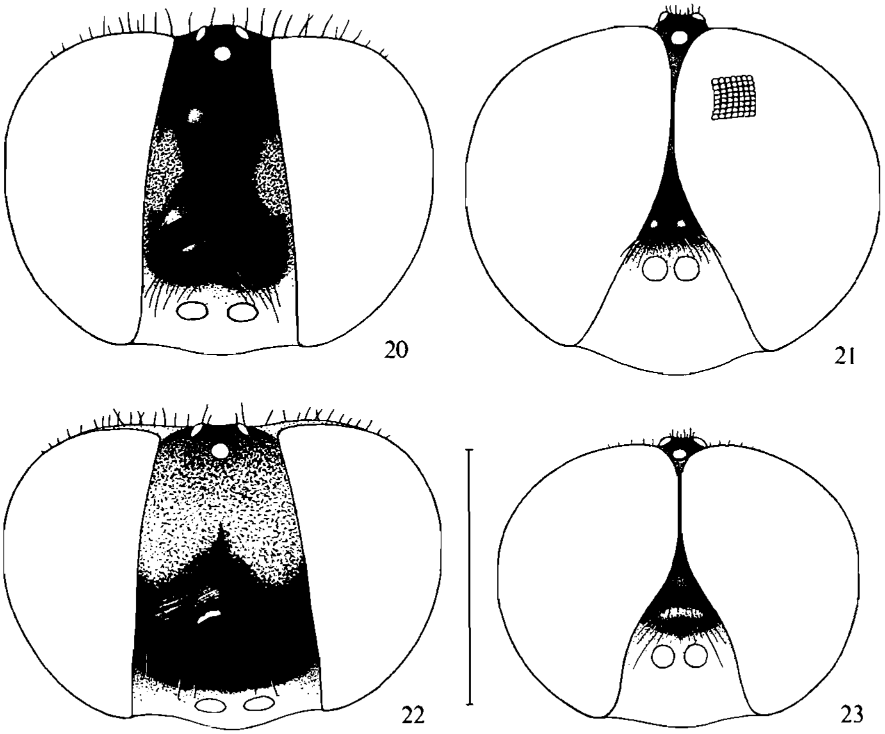
Terminalia. See generic description and Figs 2–9.

♀.

Total length. 6,2–7,2 mm.

Head. (Fig. 20). Frons narrow, width at level of anterior ocellus about 0,35 times the distance between vertex and antennal bases. Upper part of frons slightly elevated, lower part with a moderately elevated transverse ridge. Frons and vertex polished brown-black to black, with a pair of tomentose areas along eye-margin at middle; also area just above antennal bases tomentose. Otherwise as in ♂.

Thorax. Chaetation and coloration as in ♂, but mesonotal pile shorter, and pile surrounding scutellar setae only ⅕ as long as setal length.



Figs 20–23. *Orthactia* heads (dorsofrontal aspects). 20–21. *fascipennis* Kröber. 20. ♀. 21. ♂. 22. *gobabebensis* sp. n. ♀. 23. *irwini* sp. n. ♂. Scale: 1 mm.

Wings and legs. As described for ♂, but some specimens show yellow-brown femora, most often in combination with a similar paler coloration of the abdominal base (see later).

Abdomen. Coloration of tergites and sternites as described for ♂, but in some specimens the first two or three segments show a brownish ground coloration instead of the usual blackish. Only T1 has whitish pile laterally.

Type material. Kröber (1912: 27) described both sexes of his *Orthactia fascipennis*, the male on material from 'Willowmore 20–28.xi und Sunday River 25.xi.', and the female on material from 'Kapland: Sunday River 25.xii., Willowmore'; all specimens were probably collected by H. Brauns. The 'male type' was stated to be deposited in the Budapest Museum, and must now be regarded as lost. The 'female type' was stated by Kröber to be in the Vienna Museum, where two female syntypes were found to exist. As will be seen from the list of material, additional topotypic specimens are present in the Natal Museum, the South African Museum, and in the US National Museum.

Material examined. SOUTH AFRICA: *Orange Free State:* 6♂ 2♀, Caledon River between Bethulie and Aliwal N. (3026CB), x.1935, Mus. Staff (SAM). *Cape Province:* 1♂, Dikbome Merweville Koup (3221DA), x.1952, Mus. Expd. (SAM); 2♂ 2♀, Merweville Dist. (3221DA), i–ii.1947, Zinn (SAM); 7♂ 8♀, Merweville, Laingsburg Distr. (3221DA), i.1959, Zinn (SAM); 1♂, Moordenaars Karoo (3321AA), x.1952, Swanepoel (SAM); 3♂ 1♀, Gamkaspoort (3321BC), x.1937 (SAM); 3♀, Nw. Kloof, Fraserburg (3121DC), xi.1935, Mus. Staff (SAM); 1♂, Matjiesfontein (3222AB), 16–21.x.1928, Turner (BM); 3♂, Buffels River, Ladismith Div. (3320BB), x.1937, (SAM); 1♀, Rooinek, Laingsburg Distr. (3320BD), i.1949, Zinn & Hesse (SAM); 1♀, Rooinek Pass (3320BD), x.1952, Mus. Expd. (SAM); 3♂, Gamka River 40 km N Prince Albert (3321BB), 11.xi.1986, Londt & Quickelberge (NM); 1♂, Meiringspoort (3322BC), x.1937, (SAM); 8♂, Meiringspoort (3322BC), 11–12.xii.1979, rocky hillside & stream edge, Londt & Stuckenberg (NM ZMC); 1♂ 1♀, 7 km N Steytlerville (3324AB), Groot River, 30.x.1978, river bank & field, Londt & Miller (NM); 1♀, Willowmore (3323AD), x.1911, Brauns (NM); 2♂ 8♀, Willowmore, 1.xi.1912, Brauns (NM SAM ZMC); 1♀, Willowmore, xii.1912, Brauns (SAM); 1♂ 1♀, Willowmore, 10.x.1920, Brauns (NM); 2♀, Willowmore, no dates, Brauns (USNM); 1♀, Modderfontein, Willowmore (3323AD), 4.xii.1920, Brauns (NM); 1♂ 1♀, Beaufort West Dist. (3222BC), ii.1958, (SAM); 1♀, Nieuweveldt, Beaufort W. Dist. (3222BA), xi.1935, Mus. Staff (SAM); 1♀, Beaufort West (3222BC), Oukloof, i.1949, Zinn & Hesse (SAM); 1♀, Tankwa Karoo Waterval, xi.1952, Mus. Expd. (SAM); 2♀, Tankwa Karoo, (3120AD), Renoster River, xi.1952, Mus. Expd. (SAM); 1♀, Murraysburg Dist. (3123DD), xi. 1935, Mus. Staff (SAM); 2♀, Touws River→Hondewater, 18 m. E. of Touws River (3321CA), xii.1962, Mus. Staff (SAM); 1♀, Vanwyksdorp (3321CB), x.1937, (SAM); 1♀, Nieuveld Escarpment, Rietvlei (3321CD), i.1949, Zinn & Hesse (SAM); 2♀, 17 mi. N. Vanrhynsdorp at fork of Geelsbek & Sout River (3118BC), 10.ix.1972, Irwin (MEI ZMC); 1♀, Colesberg (3025CA), x.1935, Mus. Staff (SAM).

Distribution. From the Desert and Poor Steppe climatic region of the north western Cape Province through the Karoo region to the northern Steppe region of the Cape Province and OFS.

Orthactia gobabebensis sp. n.

Fig. 22.

Etymology. Named after the locality Gobabeb at the Kuiseb River, Namibia, where this species may occur abundantly.

Description, ♂.

Agrees in every respect with ♂ of *fascipennis* Kröber, except that the knob of halter is darker, usually entirely blackish.

♀.

Total length. 7,0–8,2 mm.

Head (Fig. 22). Frons moderately wide, width at level of anterior ocellus about 0,48 times the distance between vertex and antennal bases. Upper part of frons slightly elevated; lower part strongly elevated and forming a shiny black callus which forms a triangular extension dorsally. Whole upper frons, ocellar triangle, vertex and occiput entirely tomentose. Otherwise as in ♂ of *fascipennis*.

Thorax. Agrees in every respect with ♀ of *fascipennis*. Pile of scutellum may probably be slightly longer, up to ¼ of setal length.

Wings and legs. As in ♂, but knob of halter yellowish, and thus clearly distinct from ♂ which has black halter. This sexual difference is not seen in *fascipennis*.

Abdomen. Largely yellow to yellow-brown, more or less brightly coloured, and blackened to a variable degree towards apex.

Variation. There is considerable variation in the degree of yellow-brown coloration of the ♀ abdomen; the darkest condition is seen in the specimen from Doringbos.

Material examined. NAMIBIA: 1♂ (holotype) 2♀ (paratypes), Namib Desert Park (2315CA), Kuiseb River at Gobabeb, 12.ii.1974, riverine forest and sand, Irwin & Lyneborg (ZMC); 36♂ 19♀, (paratypes), same locality, 26.i.–16.ii.1978, Lomholdt (NM MEI ZMC); SOUTH AFRICA: *Cape Province:* 4♂ 1♀ (paratypes), Doringbos (3119CC), on Doring River, 500 ft., 14.ix.1972, riverbank sand dunes, Irwin (NM ZMC).

Distribution. Desert and Poor Steppe climatic region of Namibia and the north western Cape Province.

Orthactia irwini sp. n.

Figs 16, 23.

Etymology. This species is named for Dr Michael E. Irwin of Champaign-Urbana, Ill., USA, who did intensive collecting of Therevidae for the Natal Museum in the early seventies.

Description, ♂.
Total length. 6,2–7,2 mm.

Head (Fig. 23). Eyes practically touching for a distance equalling height of ocellar triangle. Facets of upper portion of eye only very slightly enlarged, and this portion of eye not elevated. Frontal triangle more raised than in *fascipennis*, mostly shiny black, only a strip above antennal bases greyish tomentose; pile on frontal triangle short and mostly pale. Upper occiput yellow-grey tomentose and with about 8 short postocular setae per side; lower occiput greyish tomentose and with a long whitish pile.—Antennal proportions: scape with a ratio of 8:11, first flagellomere with a ratio of 14:16, style 4, ie, both scape and first flagellomere shorter than maximal width (cf. *fascipennis*). Antenna brown to black, with only slight tomentum; setae and pile on scape black. Proboscis and palpi equally long, reaching well beyond antennal bases; colour and pile blackish.

Thorax. Only 3 np setae present; these and also the sa and pa setae are shorter than in other known species of the genus. Disc of mesonotum with thick uniform yellow-grey tomentum becoming more pure ash-grey laterally, and actual lateral margin, including notopleura, subshiny to shiny black. Mesonotal pile sparse, short, erect and black. Anterior half or more of mesopleuron shiny black, rest of pleura ash-grey tomentose; pleural pile whitish. Scutellum (Fig. 16): pair of sc setae short, surrounded by black pile composed of stiff, erect hairs which are about one third as long as setae; mid-posterior margin of scutellum without pile. Scutellum dull brown to dull black, depending on angle of view.

Wings. Mostly pale coloured, with only one dark transverse band. Whole proximal half of wing, to level of apex of subcosta and cross-vein r–m, pale yellowish hyaline with yellowish veins, but both anterior and posterior margins of wing appear darkened. A dark transverse band occupies distal half of wing, but is vaguely demarcated, and apex of wing whitish hyaline. Knob of halter bright yellow, almost orange.

Legs. Fore femur with 2–3 anteroventral setae; hind femur with 5–7 anteroventral setae; all setae rather short and weak. Pilosity of fore femur black, hairs as long as femoral width. Longest seta on mid metatarsus comparatively short, ie, about twice as long as metatarsal width. Legs entirely black.

Abdomen. Mostly blackish and rather shiny, T1 narrowly brownish along posterior margin, and T2 narrowly white-grey tomentose anteriorly; T2 also with a distinct whitish hindmarginal border. Pile moderately long, whitish on T1 and T2, blackish on the rest.

♂ terminalia. Similar to *fascipennis* (see Figs 2–9).

♀ (only one discoloured specimen available).

Total length. 6,8 mm.

Head. Frons narrow, width at level of anterior ocellus about 0,40 times the distance between vertex and antennal bases. Frontal pattern is difficult to describe because of discoloration, but on lower frons seems to be a shiny black callus of a shape similar to *gobabebensis*, while upper frons may be tomentose; whole frons with a short sparse pile of black, downwardly directed hairs. Otherwise as in ♂.

Thorax. Disc of mesonotum discoloured, but probably as in ♂. Pleura and scutellum coloured as in ♂, but pile surrounding the scutellar setae only about half as long ie., about ⅙ as long as setal length.

Wings and legs. As in ♂, but ventral setae of mid metatarsus longer than in ♂, longest seta about 3 times as long as metatarsal width. Pile on posterior surface of fore femur shorter than in ♂.

Abdomen. Brown-black to black and rather shiny, but along posterior margin of T1 and anterior margin of T2 are narrow yellow-brown strips, and both T1 and T2 also have white hindmarginal borders. Pile coloured as in ♂, but shorter and sparser.

Material examined. SOUTH AFRICA: *Cape Province:* 16♂ (holotype and paratypes) 1♀ (paratype), 7 mi. NE Garies (3018CA), 950 ft., 9.ix.1972, sandy hillside with flowing stream, Irwin (NM MEI ZMC).

Distribution. Desert and Poor Steppe climatic region of the north-western Cape Province.

Orthactia deserticola sp. n.

Etymology. L. *desertus* = waste, *colere* = to inhabit. Refers to the habitat of this species.

Description, ♂.

Total length. About 7,5 mm.

Head. Eyes touching for a long distance, length of eye-seam equalling about twice the height of ocellar triangle. Facets on upper portion of eye strongly enlarged, and area of enlarged facets elevated compared to lower portion of eye with smaller facets. Triangular frontal part above antennae very slightly raised, in profile view of head hardly visible. Upper part of frontal triangle blackish and shining, lower part greyish tomentose and with some long dark hairs. Upper occiput more concave than in other species of the genus, only thinly tomentose, with about 10 short black postocular setae per side, and additional pale setae more ventrally placed; lower occiput greyish tomentose and with long whitish pile. Antennal proportions: scape with a ratio of 13:12, first flagellomere with a ratio of 18:14, style 6. Antenna blackish, setae and pile on scape also blackish. Proboscis and palpi equally long, reaching level of antennal bases, colour and pile blackish.

Thorax. 4 or 5 long and strong np setae, also the pairs of sa, pa and sc setae long and strong. Mesonotum black and shiny, with at most a very indistinct greyish tomentum which does not form a pattern. Mesonotal pile long, erect and fulvous, hairs being about half as long as length of sa and pa setae. Mesopleuron shiny black and with a thin grey tomentum on lower part; pile sparse and whitish. Pair of sc setae long and strong. Lateral portions of scutellum with a dense long pile of dirty fulvous hairs, these being up to $\frac{2}{3}$ as long as sc setae; mid-posterior margin without pile. Scutellum black and rather shiny.

Wings. Patterned with dark areas which form complete transverse bands. A major dark band covers proximal third of cell r_5, distal half of discal cell, and most of cell m_3. Further, broad streaks of dark coloured microtrichia occur along veins R_4, R_5, M_1 and M_2. Other ill-marked areas are found in proximal part of wing and along anterior margin. Knob of halter whitish yellow.

Legs. Fore femur with 2–3 anteroventral setae; hind femur with 8–10 anteroventral setae; all setae weak but rather long. Pilosity of fore femur whitish and sparse. Longest seta on mid metatarsus about 5 times as long as metatarsal width. Legs entirely blackish.

Abdomen. Black and shiny, T2 with some grey tomentum on anterolateral parts, and T2–T4 with dirty white-yellow hindmarginal borders. Pile moderately long, dirty yellowish on T1 and T2, black on the rest.

Terminalia. Similar to *fascipennis* (see Figs 2–9).

♀.

Total length. 7,8 mm.

Head. Frons rather narrow, width at level of anterior ocellus about 0,45 times the distance between vertex and antennal bases. Lower frons with a rhomboid, shiny yellow-brown callus which has a strongly protruding transverse ridge above; in profile view lower frons clearly elevated. The yellow-brown coloration stretches down antennal bases and covers most of face. Upper frons is discoloured in the only specimen available. Frontal pile rather long and adpressed, composed of soft pale hairs, on lower part also blackish hairs appear. Rest as in ♂, but palpi paler, dirty brownish.

Thorax. Chaetation and pilosity as in ♂. Disc of mesonotum with pattern of tomentum, formed by a pure grey tomentose mid band which is wider than upper frons, and laterally flanked by grey-brown tomentose bands. Lateral margin of mesonotum, including notopleura, brownish and rather shiny, and so are upper and posterior parts of mesopleuron and whole pteropleuron. Rest of pleura blackish and white-grey tomentose. Scutellum dirty brownish, slightly tomentose; pilosity as described for ♂.

Wings. Basic design as described for ♂, but dark areas and streaks of blackened microtrichiae even more restricted.

Legs. Fore femur with 4 anteroventral setae; hind femur with 6–7 anteroventral setae; these mostly found in apical half. Pilosity of fore femur whitish and as long as femoral width. Longest seta on mid metatarsus as in ♂. Femora yellowish to yellow-brown, hind femur being darkest. Tibiae and tarsi brownish to brown-black.

Abdomen. In a strict dorsal view whole dorsum is yellow with following parts brown-black: T5 laterally, and entire T6 and T7. In a lateral view all tergites brown-black laterally, and sternites entirely blackish. Pile sparse and short, pale on yellow parts, blackish on dark parts.

Material examined. NAMIBIA: 2♂ (holotype and paratype), SE corner of Namib Desert Park (2315DB), near Knamhoek Farm, 860 m, 15.ii.1974, Irwin, vegetated moving dunes (NM ZMC); 1♀ (paratype), Namib Desert Park (2315CA) 2 km S. Homeb, 450 m, 13.ii.1974, Irwin, open sparsely vegetated dunes (NM).

Distribution. Deserts of central Namibia.

Orthactia albopilosa sp. n.

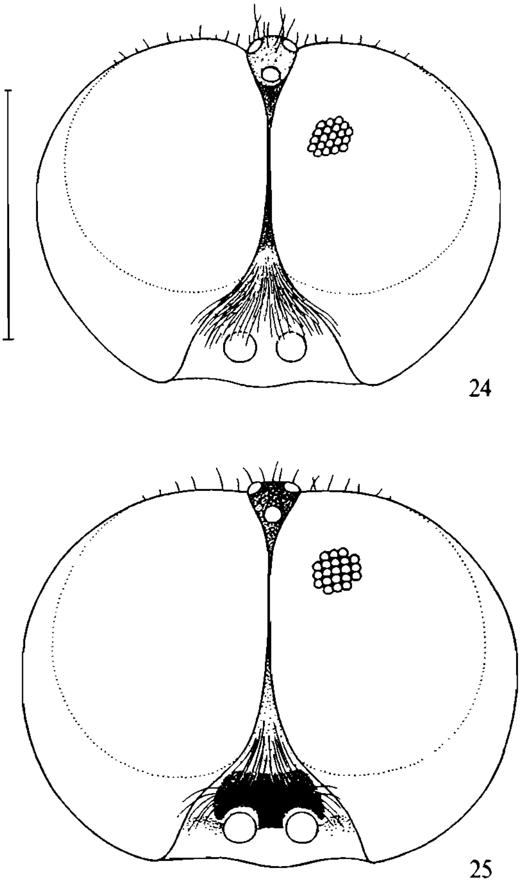
Figs 18, 24, 26–27.

Etymology. L. *albus* = white, *pilus* = hair. Refers to the whitish pilosity of this species.

Description, ♂.
Total length. 6,6–7,7 mm.

Head (Fig. 24). Eyes touching for a distance equal to 1,5 times the height of ocellar triangle. Facets on upper portion of eye strongly enlarged, and area of enlarged facets elevated over lower portion of eye with small facets. Frontal triangle very slightly raised, hardly visible in profile view of head, entirely white-grey tomentose, and with a long whitish pile. Upper occiput grey-brown tomentose and with 10–12 short black postocular setae. Lower occiput white-grey tomentose, with long whitish pilosity. Antennal proportions: scape with a ratio of 16:12, first flagellomere with a ratio of 18:14, style 4. Antenna brownish to blackish, distinctly tomentose, setae of scape black, pile on scape composed of both blackish and pale hairs. Proboscis and palpi greatly projecting beyond antennal bases; colour blackish, with distinct grey tomentum on palpi which carry a pile of mixed blackish and pale hairs.

Thorax. (3)–4–(5) np setae; these moderately long, but strong. Sa and pa setae long and strong. Disc of mesonotum striped, pattern being formed by differently coloured tomentum. In dorsal view a mid-band of yellow-grey tomentum occupies about one third of total mesonotal width. It is flanked by a pair of white-grey tomentose stripes, each of which becomes subshiny blackish laterally and is about



Figs 24–25. *Orthactia* ♂ heads (dorsofrontal aspects). 24. *albopilosa* sp. n. 25. *londti* sp. n. Scale: 1 mm.

half as wide as the mid-band. Lateral to these stripes are bands of yellow-grey tomentum (as wide as mid-band). Actual lateral margin white-grey tomentose. Mesonotal pile moderately long, mostly composed of pale yellow hairs, but black hairs occur, especially on the subshiny parts of the discal stripes and down to the area between the sa and pa setae. Upper part of mesopleuron yellow-grey tomentose, lower part white-grey tomentose, as are remainder parts of pleura; pile whitish. The total appearance of thoracic pattern is that of 5 bands of yellow-grey tomentum separated by narrower stripes of white-grey tomentum. Disc of scutellum entirely yellow-grey to pure grey tomentose and with a pale pilosity as on mesonotum. Along entire posterior margin of scutellum a dense brush of long black hairs; these are as long as scutellum and completely obscure the pair of sc setae (Fig. 18).

Wings. Pattern nearly as described for *deserticola*, ie. dark transverse bands indistinct, the broad subapical band being traversed by whitish hyaline streaks in the centre of the cells; the narrower subbasal band very indistinct and mainly confined to the middle of first basal cell and anal section of wing. Knob of halter pale yellowish.

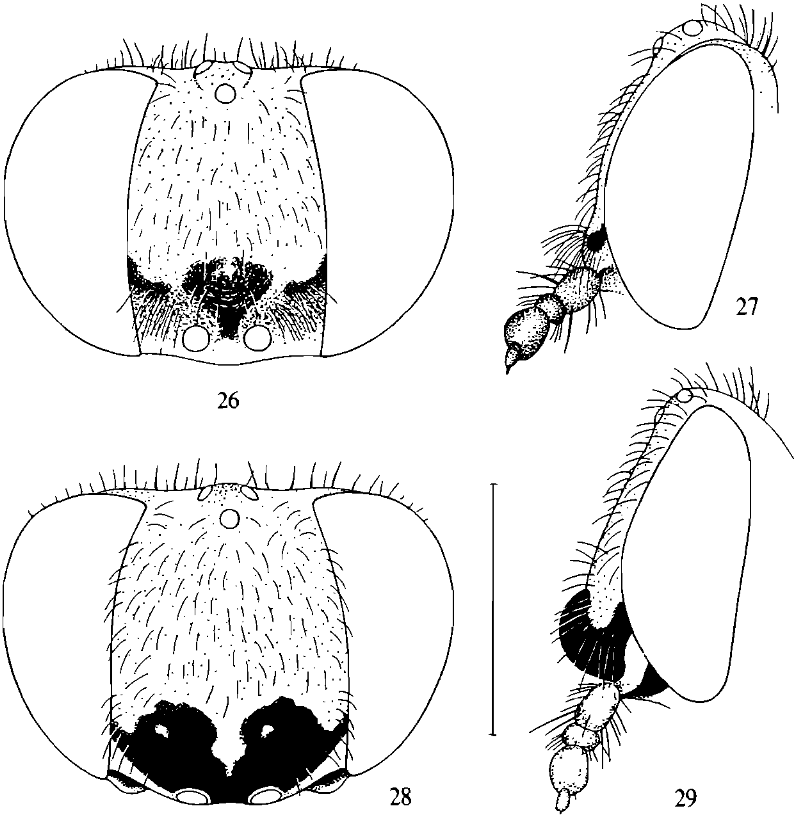
Legs. Fore femur with 4–5 anteroventral setae; hind femur with 11–13 anteroventral setae; all setae rather strong. Pilosity of fore femur long, dense and whitish. Longest seta on mid metatarsus 2,6 times as long as metatarsal width. Legs blackish, with extensive greyish tomentum, knees narrowly yellow-brown.

Abdomen. In dorsal view all tergites are black and rather shiny anteriorly, posterior parts being greyish tomentose. In lateral view tergites are dark brownish tomentose, except for T1 and anterior part of T2 which are greyish tomentose laterally. Dirty whitish hindmarginal borders appear on T2 and T3. Sternites dark brownish tomentose. Pile whitish on T1 and T2, becoming gradually more dirty white-yellow on posterior segments.

Terminalia. Very similar to those of *fascipennis* (see Figs 2–9).

♀.

Head (Figs 26–27). Frons broad, width at level of anterior ocellus about 0,6 times the distance from vertex to antennal bases. Lower frons with a small irregular



Figs 26–29. *Orthactia* ♀ heads. 26–27. *albopilosa* sp. n. 26. Dorsofrontal aspect. 27. Lateral aspect. 28–29. *londti* sp. n. 28. Dorsofrontal aspect. 29. Lateral aspect. Scale: 1 mm.

shiny black mid-callus, and more laterally on same level may appear an additional pair of small black calli. In worn specimens the black calli may be more or less confluent. In profile lower frons gradually protruding, and two blackish patches or bands appear; the upper one formed by the mentioned lateral callus, the lower one at antennal level formed by tomentum. Upper frons mostly grey-brown tomentose, tomentum being more pure grey along eye-margin and on lower part. Frontal pile all pale, hairs rather long and downwardly directed. Otherwise as in ♂, but scape and palpus generally more brownish, ie. less greyish tomentose.

Thorax. Chaetation and pattern of mesonotum and pleura as in ♂, but mesonotal pile shorter. Also blackish pilosity along posterior margin of scutellum shorter than in ♂, not totally reaching apices of sc setae.

Wings. No sexual difference in wing pattern.

Legs. Fore femur as in ♂ with 4–6 anteroventral setae, but hind femur with fewer (7–9) and shorter anteroventral setae. Pile on posterior surface of fore femur shorter than in ♂. Longest seta on mid metatarsus up to 4 times as long as metatarsal width. Femora yellowish. Fore tibia and its tarsus blackish. Mid and hind tibiae dirty yellowish, darker apically than basally.

Abdomen. Rather variable, but usually much paler and less tomentose, lateral areas of tergites and all of sternites often entirely yellowish to brownish with only very slight tomentum. Pilosity as described for ♂.

Material examined. SOUTH AFRICA: *Cape Province:* 18♂ (holotype and paratypes) 13♀ (paratypes), 10 mi. N Pella (2819CC), bank of Orange River, 940 ft., 4.ix.1972, Irwin (NM MEI ZMC); 9♂ 4♀ (paratypes), Upington (2821AC), banks of Orange River, Reits Park, 9.ix.1983, Londt & Stuckenberg (NM ZMC); 4♂ 2♀ (paratypes), Augrabies Falls Nat. Park (2820CB), 8.ix.1983, Stuckenberg & Londt, rockery & sandy areas in camp (NM).

Distribution. Desert and Poor Steppe climatic region along the Orange River in northern Cape Province.

Orthactia londti sp. n.

Figs 19, 25, 28–29.

Etymology. Named for Dr Jason G. H. Londt, who collected the material of this species.

Description, ♂.

Total length. 6,6–7,9 mm.

Head (Fig. 25). Eyes touching for a distance equal to twice the height of ocellar triangle. Facets on upper portion of eye very strongly enlarged, and area of enlarged facets elevated over lower portion of eye with small facets. Upper occiput brown-grey tomentose, with about a dozen short whitish postocular setae per side. Lower occiput white-grey tomentose, with long whitish pilosity. Antennal proportions: scape with a ratio of 17:14, first flagellomere with a ratio of 17:14, style 4. Scape and pedicel blackish with a light tomentum. First flagellomere brownish, basal part may be darkened. Setae and pile on scape black. Proboscis and palpi overreach antennal bases; both are blackish and have blackish pile.

Thorax. As described for *albopilosa*, with the following differences; white-grey tomentose stripes on disc of mesonotum narrower, less distinctly marked, and not appearing subshining laterally. Mesonotal pile exclusively composed of whitish hairs. Brush of long hairs along posterior margin of scutellum composed of both blackish and pale hairs (Fig. 19).

Wings. Pattern restricted to a narrow brownish band from apex of subcostal cell over base of cell r_5 to hind wing-margin at outrun of veins M_2 and M_3; also a small darkened area at apex of second basal cell. Rest of wing has a whitish hyaline tinge. Knob of halter pale yellowish.

Legs. Fore femur with 4 anteroventral setae; hind femur with 7–8 anteroventral setae; all setae rather weak. Pilosity of fore femur long dense and whitish. Longest seta on mid metatarsus about 3 times as long as metatarsal width. Colour as in *albopilosa*.

Abdomen. In dorsal view all tergites nearly entirely pale grey-brown tomentose, only with narrow black-brown anterior bands on T2–T4; laterally on tergites tomentum has same colour as on dorsum (cf. *albopilosa*). Dirty whitish hindmarginal borders on T2 and T3. Sternites subshiny blackish with a thin tomentum. Pile nearly all whitish and rather long.

Terminalia. Agree with those described and figured for *fascipennis* (cf. Figs 2–9), except for the anteriorly directed, smaller branch of the fork formed by the gonostylus; this is more broadly lamellate.

♀.

Total length. 6,8 mm.

Head (Figs 28–29). Frons broad, width at level of anterior ocellus about 0,65 times the distance from vertex to antennal bases. Lower frons with a large, bilobed, shiny black callus, which also covers area between antennal bases. In profile lower frons very strongly protruding, forming an overhanging ridge above antennal bases; the shiny black callus is clearly visible and a dull black stripe appears at level of antennal bases (as in *albopilosa*). Upper frons grey-brown tomentose. Frontal pile pale, hairs rather short and erect, and absent from callus. Otherwise as in ♂, but antennae and palpi entirely yellow-brown.

Thorax. As in ♂, but pilosity along posterior margin of scutellum composed of mostly pale golden hairs.

Wings. As described for ♂.

Legs. Chaetation and pilosity of femora and mid metatarsus as in ♂. Femora, tibiae and tarsi yellow, fore tibia and its metatarsus more dirty yellowish.

Abdomen. Entirely yellowish, on dorsum partly and very thinly greyish tomentose. Pile exclusively whitish except on terminalia, where it is black and short.

Material examined. SOUTH AFRICA: *Cape Province:* 4♂ (holotype and paratypes) 1♀ (paratype), Roaring Sands resort near Witsand (2822CB), 17–18.iii.1982, Londt & Schoeman, Acacia woodland/sandy area (NM ZMC); 1♂ (paratype), Ca. 65 km SE Noenieput (2720DC), 20.iii.1982, Londt & Schoeman, kloof/green scrubs (NM).

Distribution. Desert and Poor Steppe climatic region of the northern Cape Province.

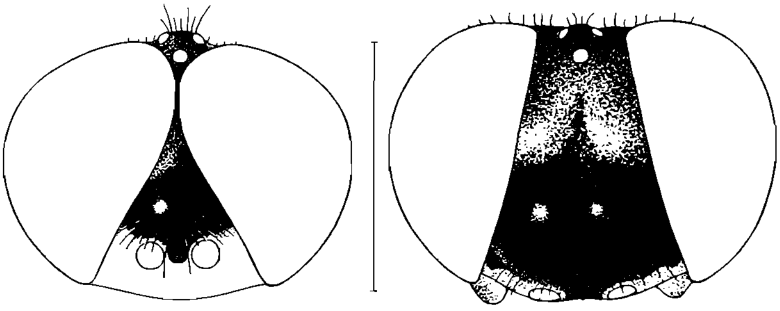
Orthactia penicillata sp. n.

Figs 17, 30–31.

Etymology. L. *penicillus* = painter's brush. Refers to the double brush on scutellum.

Description, ♂.
Total length. 6,9 mm.

Head (Fig. 30). Eyes not entirely touching, and only for a distance shorter than height of ocellar triangle. All facets equally small, and upper part of eye not elevated. In consequence of the very short eye-seam the frontal triangle is very large, shiny black, and in profile is distinctly raised. Lower half of frontal triangle provided with a stiff erect black pile. Upper occiput dull brownish black, with pile of short black hairs; any postocular setae do not distinguish. Lower occiput dark grey tomentose, pile black and more stiff than in other species. Antennal proportions: scape with a ratio of 11:9, first flagellomere with a ratio of 13:10, style 5. Antenna black, not tomentose; setae and pile black. Palpi shorter than proboscis; both blackish and provided with black pile.



Figs 30–31. *Orthactia penicillata* sp. n. heads (dorsofrontal aspects). 30. ♂. 31. ♀. Scale: 1 mm.

Thorax. 3–4 np setae; these are moderately long but strong, as are the sa and pa setae. Disc of mesonotum covered by a uniform, unpatterned tomentum of a brown-grey colour; laterally mesonotum is subshiny blackish. Mesonotal pile spread, moderately long, and composed of stiff black hairs. Anterior part of mesopleuron black, rest of pleura thinly greyish tomentose, and with a whitish pile. Scutellum dull brown-black, without pile on disc and along mid-posterior margin. A dense brush of long black hairs on each postero-lateral corner of scutellum; hairs longer than length of scutellum; the brushes have a nearly vertical position and completely obscure the pair of sc setae (Fig. 17).

Wings. Extensively dark brownish in apical half, wing-tip narrowly whitish hyaline. Basal half of wing whitish hyaline in apical part of first basal cell and basal part of discal cell, darker along anterior margin. Knob of halter black.

Legs. Fore femur without anteroventral setae, with a long pilosity of stiff, blackish hairs on posterior surface. Hind femur with only 2 or 3 anteroventral setae, but additional long, black pile in same position. Longest seta on mid metatarsus about 2,5 times as long as metatarsal width. Legs entirely blackish.

Abdomen. Black and subshiny, and anterior margin of T2 with a greyish tomentum. Very marked, white hindmarginal borders appear on T1 and T2. Pile mostly black and stiff, only pale hairs along posterior margins of T1 and T2.

Terminalia. The single ♂ available was not dissected.

♀.

Total length. 6,8–7,2 mm.

Head (Fig. 31). Frons narrow, width at level of anterior ocellus about 0,35 times the distance from vertex to antennal bases. Lower half of frons raised and shiny black. Upper half of frons level with eyes and uniformly dull blackish in frontal view; in dorsal view appearing mostly dark brownish tomentose, with a triangular dull blackish area raised above upper margin of callus, and laterally to this more greyish tomentose. Frontal pile all black, on upper half short and rather adpressed, on lower part longer and more erect, and present only on lower part of callus. Otherwise as in ♂.

Thorax, wings, legs and abdomen. As described for ♂.

Material examined. SOUTH AFRICA: *Cape Province:* 1♂ (holotype) 3♀ (paratypes), Hondeklipbaai (3017AD), 8.ix.1972, Irwin, coastal dunes (NM ZMC); 1♀ (paratype), Namaqualand, Wallekraal, x.1950, Mus. Exp. (SAM).

Distribution. Desert and Poor Steppe of the coastal lowland of northern Cape Province.

ACKNOWLEDGEMENTS

I wish to thank Dr Michael E. Irwin, Champaign-Urbana, Ill., USA and Dr Jason G. H. Londt, of the Natal Museum, for providing specimens for this study, and Mr Robert Nielsen, of the Copenhagen Zoological Museum, for carefully executing the drawings.

DEPOSITORIES

BMNH = British Museum (Natural History), London, England.
MEI = Collection of Dr M. E. Irwin, Champaign-Urbana, Ill., USA
NM = Natal Museum, Pietermaritzburg, South Africa.
SAM = South African Museum, Cape Town, South Africa.
USNM = US National Museum, Washington, DC USA
ZMC = Zoological Museum, Copenhagen, Denmark.

REFERENCES

KRÖBER, O. 1912–13. Monographie der paläarktischen und afrikanischen Thereviden. *Dt.ent.Z.* 1912: 1–32, 109–140, 251–266, 395–410, 493–508, 673–704; 1913: 17–32, 147–162, 255–270.

LYNEBORG, L. 1980. Family Therevidae. *In* R. W. Crosskey ed. *Catalogue of the Diptera of the Afrotropical Region:* British Museum (Natural History) pp. 314–320.

——— 1983. A review of the Palaearctic genera of Phycinae (Insecta, Diptera, Therevidae). *Steenstrupia* **9** (8): 181–205.

——— 1987. Notes on the Phycini of southern Africa, with the description of a new genus and two new species (Diptera: Therevidae: Phycinae). *Ann. Natal Mus.* **28** (2): 467–474.

Date received: 9 May 1988.